

**Amendments to the Claims:**

Please amend claims 1, 6, 9, 14, 15, 19, 29, 32, 37 and 42. Please cancel claims 4, 5, 10, 11, 16, 23, 26, 27, 33, 34, 41 and 44. Following is a complete listing of claims, as amended:

1. (Currently amended) An ampoule for producing a reaction gas for processing a microfeature workpiece in a reaction chamber, the ampoule comprising:  
a vessel including an interior volume having a precursor region configured to receive a precursor and a headspace above the precursor region;  
a conduit in the vessel, the conduit having a first portion in the precursor region, a second portion in the headspace, an opening in the first portion positioned to be in the precursor, and an outlet in the second portion positioned to be in the headspace; ~~and~~  
a flow driver for flowing precursor through the conduit and into the headspace; and  
a precursor exposure assembly at least partially within the headspace, the precursor exposure assembly including a plurality of trays configured in a stack and positioned so that at least some nonvaporized precursor flows from the conduit into at least one of the trays to  
increase the surface area of the precursor exposed to a carrier gas.

2. (Original) The ampoule of claim 1 wherein:  
the conduit comprises a lift tube having the opening and the outlet; and  
the flow driver comprises a carrier gas conduit positioned relative to the lift tube to flow carrier gas into the lift tube via the opening and entrain precursor in the carrier gas.

3. (Withdrawn) The ampoule of claim 1 wherein:  
the conduit comprises a lift tube having the opening and the outlet; and  
the flow driver comprises a pump configured to flow precursor through the lift tube.

4. (Cancelled)

5. (Cancelled)

6. (Currently amended) The ampoule of claim 1, ~~further comprising a precursor exposure assembly at least partially within the headspace, the precursor exposure assembly~~

~~including a plurality of trays configured in a stack and positioned so that at least some of the nonvaporized precursor flows from the conduit into a tray at the top of the stack, the trays having wherein the plurality of trays have at least approximately the same cross-sectional dimension and a plurality of notches so that precursor flows downward from one tray to an adjacent tray, the trays being configured to carry discrete volumes of precursor to increase the surface area of the precursor exposed to the carrier gas.~~

7. (Cancelled)

8. (Cancelled)

9. (Currently amended) An ampoule for producing a reaction gas for processing a microfeature workpiece in a reaction chamber, the ampoule comprising:

a vessel including an interior volume configured to receive a precursor with a headspace above the precursor; ~~and~~

a carrier gas conduit for conveying a flow of carrier gas in the vessel, the carrier gas conduit having an outlet positioned to be in the headspace and an opening positioned to be in the precursor so that the carrier gas entrains precursor as the carrier gas flows through the conduit; and

a precursor exposure assembly at least partially within the headspace, the precursor exposure assembly including a plurality of trays configured in a stack and positioned so that at least a portion of the precursor flows from the carrier gas conduit into at least one of the trays to increase the surface area of the precursor exposed to the carrier gas.

10-13. (Cancelled)

14. (Currently amended) An ampoule for producing a reaction gas for processing a microfeature workpiece in a reaction chamber, the ampoule comprising:

a vessel including an interior volume configured to receive a precursor with a headspace above the precursor;

a first conduit having an opening positioned to be in the precursor and an outlet positioned to be in the headspace; ~~and~~

a carrier gas conduit for conveying a flow of carrier gas in the vessel, the carrier gas conduit having an outlet positioned relative to the first conduit to flow the carrier gas into the first conduit via the opening and entrain precursor in the carrier gas; and

a precursor exposure assembly at least partially within the headspace, the precursor exposure assembly including a plurality of trays configured in a stack and positioned so that at least some precursor flows from the first conduit into at least one of the trays to increase the surface area of the precursor exposed to the carrier gas.

15. (Currently amended) The ampoule of claim 14, ~~further comprising a precursor exposure assembly at least partially within the headspace and positioned so that at least some of the nonvaporized precursor flows from the first conduit onto the precursor exposure assembly to increase the surface area of the precursor exposed to the carrier gas wherein the at least some precursor that flows into at least one of the trays comprises nonvaporized precursor.~~

16–18. (Cancelled)

19. (Currently amended) An ampoule for producing a reaction gas for processing a microfeature workpiece in a reaction chamber, the ampoule comprising:

a vessel including an interior volume configured to receive a precursor with a headspace above the precursor;

a conduit for conveying a flow of precursor to the headspace;

a carrier gas inlet for flowing carrier gas into the vessel; and

a precursor exposure assembly comprising a plurality of trays configured in a stack at least partially within the headspace and positioned so that at least some of the nonvaporized a portion of the precursor flows from the conduit onto the precursor exposure assembly to increase the surface area of the precursor exposed to the carrier gas.

20. (Original) The ampoule of claim 19 wherein:

the conduit comprises a lift tube having an opening positioned to be in the precursor and an outlet positioned to be in the headspace; and

the ampoule further comprises a carrier gas conduit coupled to the carrier gas inlet and the lift tube, the carrier gas conduit configured to convey a flow of carrier gas into the lift tube and entrain precursor in the carrier gas.

21. (Original) The ampoule of claim 19 wherein:

the conduit comprises a lift tube having an opening positioned to be in the precursor and an outlet positioned to be in the headspace; and

the ampoule further comprises a carrier gas conduit coupled to the carrier gas inlet and having an outlet positioned relative to the lift tube to flow carrier gas into the lift tube via the opening and entrain precursor in the carrier gas.

22. (Withdrawn) The ampoule of claim 19 wherein:

the conduit comprises an opening positioned to be in the precursor and an outlet positioned to be in the headspace; and

the ampoule further comprises a pump configured to flow precursor through the conduit.

23-27. (Cancelled)

28. (Withdrawn) The ampoule of claim 26 wherein:

the conduit comprises a lift tube having the opening and the outlet; and

the means for flowing precursor comprises a pump configured to flow precursor through the lift tube.

29. (Currently amended) An ampoule for producing a reaction gas for processing a microfeature workpiece in a reaction chamber, the ampoule comprising:

a vessel including an interior volume configured to receive a precursor with a headspace above the precursor;

a conduit for conveying a flow of precursor into the headspace; and

a flow driver for flowing precursor through the conduit and into the headspace ~~to increase the surface area of the precursor exposed to a carrier gas; and~~

a precursor exposure assembly at least partially within the headspace, the precursor exposure assembly including a plurality of trays arranged in a stack so that at least some nonvaporized precursor flows from the conduit into at least one of the trays to increase the surface area of the precursor exposed to a carrier gas.

30. (Original) The ampoule of claim 29 wherein:

the conduit comprises an opening positioned to be in the precursor and an outlet positioned to be in the headspace; and

the flow driver comprises a carrier gas conduit positioned relative to the conduit to flow carrier gas into the conduit via the opening and entrain precursor in the carrier gas.

31. (Withdrawn) The ampoule of claim 29 wherein:

the conduit comprises an opening positioned to be in the precursor and an outlet positioned to be in the headspace; and

the flow driver comprises a pump configured to flow precursor through the conduit.

32. (Currently amended) A system for depositing materials onto a microfeature workpiece in a reaction chamber, the system comprising:

a vessel including an interior volume configured to receive a precursor with a headspace above the precursor;

a carrier gas conduit for conveying a flow of carrier gas in the vessel, the carrier gas conduit having an outlet positioned to be in the headspace and an opening positioned to be in the precursor so that the carrier gas entrains precursor as the carrier gas flows through the conduit;

a gas delivery line in fluid communication with the headspace; ~~and~~

a gas phase reaction chamber coupled to the gas delivery line; ~~and~~

a plurality of trays positioned at least partially within the headspace, the trays being configured in a stack and arranged so that at least a portion of the precursor flows from the carrier gas conduit into at least one of the trays.

33-36. (Cancelled)

37. (Currently amended) A system for depositing materials onto a microfeature workpiece in a reaction chamber, the system comprising:

a vessel including an interior volume configured to receive a precursor with a headspace above the precursor;

a carrier gas line for providing carrier gas to the vessel;

a conduit having an opening positioned to be in the precursor and an outlet positioned to be in the headspace;

a flow driver for flowing precursor through the conduit and into the headspace ~~to increase the surface area of the precursor exposed to the carrier gas;~~

a gas delivery line in fluid communication with the headspace; ~~and~~

a gas phase reaction chamber coupled to the gas delivery line; and

a plurality of trays positioned at least partially within the headspace and configured such that at least some precursor flows into at least one of the trays to increase the surface area of the precursor exposed to the carrier gas.

38. (Original) The system of claim 37 wherein:

the conduit comprises a lift tube having the opening and the outlet; and

the flow driver comprises a carrier gas conduit coupled to the carrier gas line and the lift tube, the carrier gas conduit configured to convey a flow of carrier gas into the lift tube and entrain precursor in the carrier gas.

39. (Original) The system of claim 37 wherein:

the conduit comprises a lift tube having the opening and the outlet; and

the flow driver comprises a carrier gas conduit coupled to the carrier gas line and having an outlet positioned relative to the lift tube to flow carrier gas into the lift tube via the opening and entrain precursor in the carrier gas.

40. (Withdrawn) The system of claim 37 wherein:

the conduit comprises a lift tube having the opening and the outlet; and

the flow driver comprises a pump configured to flow precursor through the lift tube.

41. (Cancelled)

42. (Currently amended) A system for depositing materials onto a microfeature workpiece in a reaction chamber, the system comprising:

a vessel including an interior volume configured to receive a precursor with a headspace above the precursor;

a conduit for conveying a flow of precursor to the headspace;

a carrier gas line for providing carrier gas to the vessel;

a precursor exposure assembly comprising a plurality of trays configured in a stack at least partially within the headspace and positioned so that at least some ~~of the~~ nonvaporized precursor flows from the conduit onto the precursor exposure assembly to increase the surface area of the precursor exposed to the carrier gas;

a gas delivery line in fluid communication with the headspace; and

a gas phase reaction chamber coupled to the gas delivery line.

43. (Original) The system of claim 42 wherein:

the conduit comprises a lift tube having an opening positioned to be in the precursor and an outlet positioned to be in the headspace; and

the system further comprises a carrier gas conduit coupled to the carrier gas line and the lift tube, the carrier gas conduit configured to convey a flow of carrier gas into the lift tube and entrain precursor in the carrier gas.

44-66. (Cancelled)